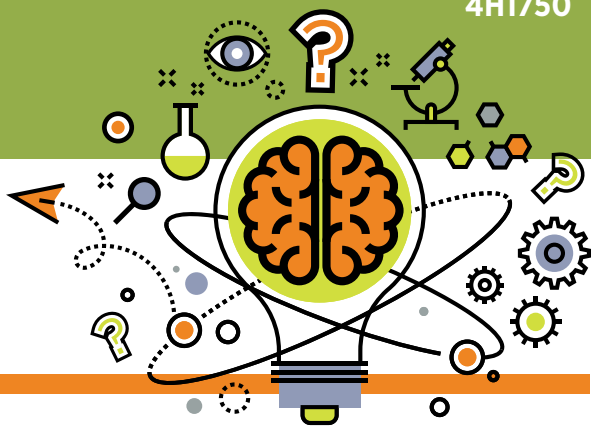
TEACHING SCIENCE

...when you don't know diddly-squat



Why did pirates wear eye patches?

Purpose:

The purpose is **not** to teach specific content, but to teach the process of science – asking questions and discovering answers. This activity encourages young people to try to figure things out for themselves rather than just read an answer on the internet or in a book. As a leader, try not to express your opinion, but let the youth engage in arguments based on evidence.

Time required:

20 minutes or multiple days depending on the interest and questions the youth have

Materials:

- ❏ Blindfolds or eye patches (one for each participant)
- ❏ Dark room
- ❏ Bright room
- ❏ Index cards (at least one per participant)
- ❏ Writing utensil
- ❏ Flashlight
- ❏ Stopwatch, phone or clock with second hand
- ❏ Paper on which to record data

Preparation:

Use the index cards to make code cards by marking with five random numbers or letters. Prepare the dark area by setting a flashlight away from the stack of code cards. The goal is to create a dimly lit or dark space so participants can try to read in the dark. The participants will not touch the flashlight or move the code cards closer to the light. Have youth cover one eye right away, so the eye is adjusting during the initial discussions.

SCIENCE PRACTICE:
Asking questions and defining problems

1. *Do you see better at night or during the day? Why? When you have been out in the dark for a while, does your night vision get better? Why is that? Could that adjusted night vision have a benefit for people who want to be sneaky in the dark? Why do you think pirates wore eye patches? Do you think wearing an eye patch would let you see better in the dark?*

SCIENCE PRACTICE:
Planning and carrying out investigations

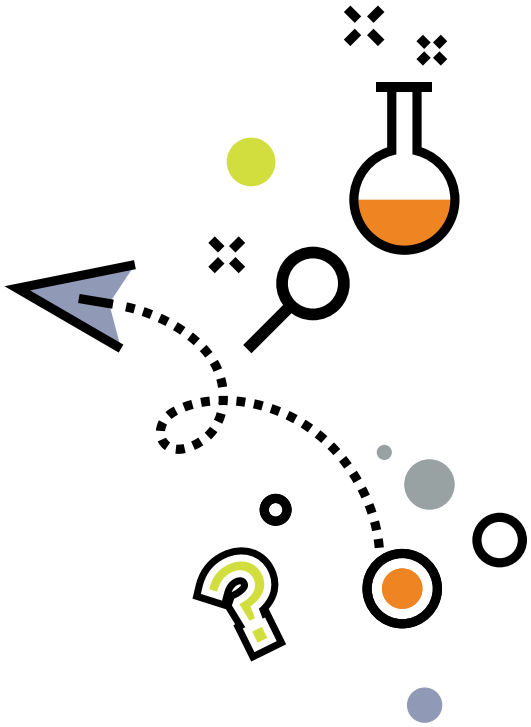
2. *How well do you think you see in the dark? Could you develop a test to determine if there is a way to make seeing in the dark easier?*

3. Tell the youth: With one eye covered and one eye uncovered, walk into the dimly lit room, don't touch the flashlight, look for a code card but don't move the stack of cards. When you walk in, read aloud the card using only your uncovered eye. *How well do you see it?* Now, take off the eye patch and read aloud a different card. (Have someone outside the room record the letters and numbers that each youth reads aloud.) Give the cards you read to the recorder when you come out so they can record what was written. (Youth will have time to consider how well they read in the dark after everyone has had a turn.) *How well did you see it with the eye that was previously covered? Was the card easier to read with one eye or other? Which one? Why do you think that was?*

Can You Read in the Dark?

Name	What was read with uncovered eye	What was written	What was read with eye that was previously covered	What was written

You do not need all the answers to teach science. You simply need an inquisitive mind and to be willing to carry out an investigation.



SCIENCE PRACTICE:
Analyzing and interpreting data

4. Compare how well you were able to read the code on the cards with your uncovered eye and after you removed the eye patch. *Did wearing an eye patch make it easier to see in the dark room? Were you able to read the code quicker or more accurately when you used the eye that had been covered? Did the eye patch work for everyone?*

SCIENCE PRACTICE:
Constructing explanations and designing solutions

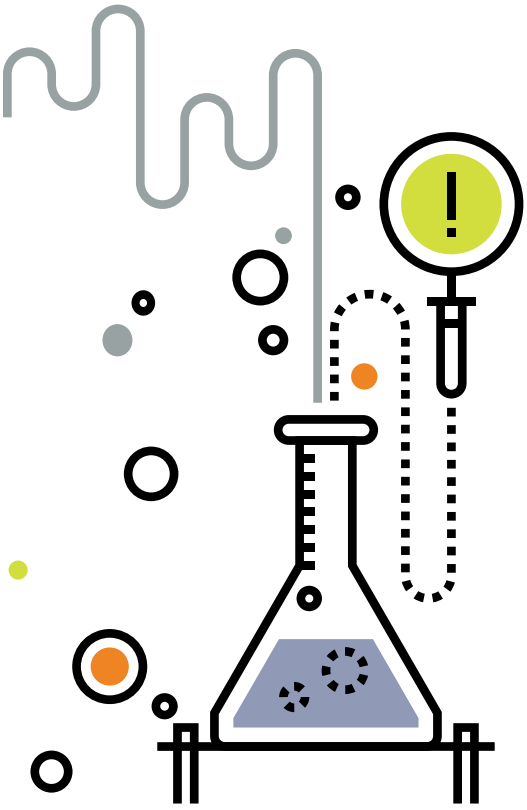
5. *Based on what you observed and the data collected, what did you discover? Do you think pirates wore an eye patch to be able to quickly move from the sunlight outdoors to the dark of below deck?*

SCIENCE PRACTICE:
Obtaining, evaluating, and communicating information

6. *Can you think of any jobs where what you discovered might be useful?*

Other thoughts:

- Try moving the light a different distance from the code cards and repeat. *Is there a distance where no one can read the cards? Do some people have better vision in the dark than others?*
- Time participants and see how long it takes them to read the card with the uncovered and covered eye. *Is there a difference?*
- *Is there is a difference in accuracy of reading the card with the uncovered vs. covered eye?*



Science & Engineering Practices:

These eight Science and Engineering Practices come from *A Framework for K–12 Science Education* (National Research Council, 2012, p. 42). These research-based best practices for engaging youth in science are connected to in-school science standards that all children must meet.

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Reference:

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. National Academies Press.

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